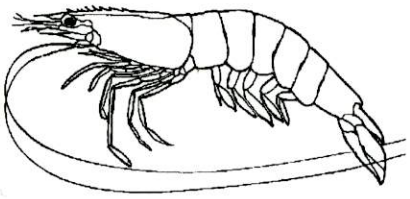

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Fisheries Science Center
Galveston Laboratory
4700 Avenue U
Galveston, TX 77551

June 24, 2009

To All Concerned:

FORECAST FOR THE 2009 BROWN SHRIMP SEASON IN THE WESTERN GULF OF MEXICO, FROM THE MISSISSIPPI RIVER TO THE U.S. - MEXICO BORDER.

Prediction Summary

Each June, scientists at the National Marine Fisheries Service (NOAA Fisheries) Southeast Fisheries Science Center's Galveston Laboratory forecast brown shrimp production from the western Gulf of Mexico for the upcoming year (July 2009 – June 2010). Data obtained from NOAA Fisheries Galveston Laboratory Fishery Management Branch, NOAA Fisheries port agents, National Climatic Data and Weather Centers, Louisiana Department of Wildlife and Fisheries, Texas Parks and Wildlife Department, and the commercial shrimp industry contribute to this forecast. Juvenile brown shrimp abundance and growth estimates are obtained through monitoring the inshore commercial shrimp fisheries in Texas and the inshore and nearshore fisheries in Louisiana. Environmental variables are further assessed to quantify the amount and type of habitat required for growth and survival of young shrimp. Collectively, these indices provide the estimate of stock strength prior to movement into the offshore fishery.

The Galveston Bay Bait Index forecasts a harvest of 24.7 million pounds from production in offshore Texas waters from July 2009 through June 2010. This is approximately 1.3 million pounds below the 1960-2007 historical average. However, the 2009 Environmental Model showed favorable conditions in the bay system and predicts above average production for Texas offshore waters. Louisiana indices point to slightly below average brown shrimp yield this season from west of the Mississippi River to the Texas-Louisiana border. Input variables used in Louisiana Model are dependent on May catch production from Louisiana. Similar to last year, and due to economic and post-hurricane related factors, many vessels in Louisiana and Texas remained at the dock. Thus commercial fishery data used in current prediction models may not accurately reflect overall shrimp abundance due to reduced effort and catch. Nevertheless, we choose to use the Louisiana Model as our best estimate of production. Yield from Louisiana inshore and nearshore waters is predicted to be approximately 29.2 million pounds. Overall, the western Gulf of Mexico should expect an annual brown shrimp production of approximately 53.9 million pounds during the 2009-2010 season. This is slightly above last year, but below the 1960-2007 historical average of 56.9 million pounds for the two-state area.

During the late winter and early spring of 2009, warm air and water temperatures, high salinities and above average tidal water heights (Tables 1 through 3) in estuarine marsh habitats were favorable for the survival and growth of the subsequent offshore populations. Postlarval brown shrimp begin entering estuaries in Texas and western Louisiana in mid-February and continue through July, depending on environmental conditions. Several waves of postlarve may enter; however, peak recruitment occurs from February through early April. A wide array of environmental and biological parameters affects the fate of young shrimp entering the estuaries. Three environmental variables, temperature, salinity and water height, have been correlated with subsequent shrimp production. Optimal shrimp growth has been documented in waters of greater than 68° F. Favorable nursery area appears to be related to the distribution of high salinity waters as well as tidal water height in interior marshes. All of these favorable environmental attributes were observed this year. Although predicted values are slightly below the 1960-2007 historical average, environmental factors reflect a strong biological potential.

Environmental Model

The Environmental Model is used to predict the annual harvest related to the historical production. The model uses Galveston air temperature during mid-April (the key component), rainfall during early March, and bay water height during late April and early May. These components are additive in the model, thus higher values indicate higher catch. The largest contributing factor, temperature during mid-April, was near average this year (69.9°F; Table 3). Rainfall during early March was low (Trace = 0.005"). These were offset by relatively high tides during late April and early May (~5.61'). Collectively, the factors suggest above average production of brown shrimp from Texas as related to environmental conditions conducive for optimal shrimp growth and survival.

Catch per Unit Effort (CPUE) in the Inshore Texas Fishery

Texas bay commercial brown shrimp catch rates and size composition data for May 2009 were obtained from NOAA Fisheries port agents. Most Texas Bays experienced above average catch rates with the exception of Galveston Bay, which was below the (1986-2008) historical average (Table 4). The May brown shrimp size composition in Aransas and Galveston Bays was dominated by small shrimp (100+ count). Corpus Christi and Matagorda Bays catches were primarily 61-70 count/pound shrimp, with San Antonio Bay comprised of 61-70 and 51-60 count/pound shrimp.

Galveston Bay Production/Baxter Bait Index

The Galveston Bay Bait Index, consistently our most reliable estimate of subsequent brown shrimp production off the Texas coast for the past 49 years, is derived from monitoring the Galveston Bay bait shrimp fishery during late April through mid-June (Baxter Bait Index; Table 5). Recruitment into the commercial bait fishery was earlier this year as compared to previous years. Strong recruitment continues to be observed, thus our forecast may be underestimated. High salinities increased available nursery habitat allowing for a wider distribution of young brown shrimp; however, not all traditional shrimp grounds were accessible this year due to the debris from Hurricane Ike. Using the period from 1981 through 2007 in the bait versus offshore landings modified regression model, a value of 24.7 million pounds is forecast for 2009-2010 catch in Texas offshore waters. This value is 1.3 million pounds below the average catch of 26.0 million pounds for the 1960 - 2007 period.

Louisiana Inshore - Offshore Production

Catch information from Louisiana inshore and offshore fisheries in May is used to estimate total production for the biological year from May through April (Table 6). Decreased shrimping effort resulting from economic factors may reduce overall production used in our forecast model. Using 2009 May catch data (7.4 million pounds) in our Louisiana Model, we predict a harvest of 29.2 million pounds for Louisiana west of the Mississippi River for the 2009-2010 season. This is below the historical average of 30.9 million pounds. Freshwater discharge data from the Mississippi River were obtained from the Louisiana Department of Wildlife and Fisheries (Table 6). Mississippi River discharge was 767 thousand cubic feet per second in April, lower than recorded in 2008, and similar to that of years above average production.

Summary

The 2009 indices of juvenile shrimp abundance indicate a slightly below average brown shrimp harvest for the western Gulf of Mexico during the July 2009 - June 2010 season. Environmental conditions favor above average shrimp production this year, but the total catch from the shrimp fishery is expected to be slightly below average. If you would like more information regarding this forecast, or for other marine fishery information, please contact us at 409-766-3500, or visit our web site at <http://galveston.ssp.nmfs.gov/>.

Sincerely,

Roger Zimmerman, Ph.D.
Laboratory Director

attachments

Table 1. Rainfall and air temperature during 2009 for selected areas. Source: NOAA, National Climatic Data Center and National Weather Service, June 13, 2009.

	Year-to-Date Rainfall (Inches)	Rainfall (Inches Above/ Below Historical)	Departure: Above or Below Historical Monthly Average Air Temperature (°F) and Precipitation (inches)							
			JAN		FEB		MAR		APR	
TEXAS			Temperature	Rainfall	Temperature	Rainfall	Temperature	Rainfall	Temperature	Rainfall
Brownsville	5	-4	4	-1	7	-1	1	-1	2	-2
Corpus Christi	3	-9	3	-2	6	-2	1	-1	4	-2
Houston	17	-4	2	-3	6	-1	1	1	0	7
Port Arthur	23	-2	2	-5	4	-2	0	1	0	7
LOUISIANA										
Lake Charles	21	-3	3	-5	3	-1	1	3	1	4
New Orleans	21	-8	3	1	3	-1	3	0	1	-4

Table 2. Salinities and water temperatures in West Galveston Bay during April and May, 1982-2009. Source for salinity and temperature data 1997-2009: Texas Parks and Wildlife Department.

Year	Offshore Catch (Millions of Pounds)		Salinity (PPT)			Water Temperature (°F)	
			APR	MAY		APR	MAY
1982	21.6		24	20		76	77
1983	18.1		24	28		66	74
1984	24.1		28	32		78	82
1985	30.3		21	25		79	82
1986	27.1		27	28		75	78
1987	27.2		32	31		84	79
1988	22.5		25	25		78	79
1989	30.3		26	25		77	83
1990	33.3		15	18		NA	84
1991	32.9		15	15		74	81
1992	24.7		15	21		73	82
1993	21.1		20	19		73	74
1994	25.5		21	20		78	79
1995	23.5		18	19		70	78
1996	22.3		30	29		77	81
1997	17.0		13	16		70	78
1998	27.0		22	30		71	86
1999	22.0		28	28		82	86
2000	31.1		31	29		81	82
2001	24.6		17	24		74	81
2002	23.3		21	24		75	82
2003	25.3		23	21		71	80
2004	21.5		14	10		72	77
2005	20.3		23	28		73	75
2006	25.2		29	30		77	79
2007	19.1		23	19		70	80
2008	18.3*		24	24		75	81
2009			29	21		72	76

*Preliminary

Table 3. Environmental Model prediction of the trend in catch of Texas brown shrimp offshore production (July-June).

Year	Direction of Prediction Relative to Average	Air Temperature (°F)	Rainfall (inches)	Water Height (feet)	Offshore Catch (Millions of Pounds)	
1990	+	68.3	0.83	5.69	33.3	
1991	+	73.2	0.11	5.87	32.9	
1992	-	66.6	0.48	4.90	24.7	
1993	-	66.9	0.86	5.41	21.1	
1994	+	71.2	1.26	5.57	25.5	
1995	+	72.7	1.07	5.38	23.5	
1996	-	70.3	0.70	4.88	22.3	
1997	+	68.3	0.37	5.47	17.0	
1998	-	68.5	0.48	5.14	27.0	
1999	+	70.8	0.24	5.34	22.0	
2000	+	70.3	0.07	5.42	31.1	
2001	+	74.3	0.49	5.19	24.6	
2002	+	74.1	1.24	6.18	23.3	
2003	+	68.9	0.17	5.55	25.3	
2004	+	69.1	0.16	5.07	21.5	
2005	+	72.9	1.67	6.10	20.3	
2006	-	67.0	0.01	5.22	25.2	
2007	+	68.8	0.00	5.60	19.1	
2008	+	68.9	0.89	5.61	18.3*	*Preliminary
2009	+	69.9	0.01	5.61		

Table 4. Estimated average May inshore commercial shrimp catch in pounds per hour (heads-on) for selected Texas Bays, 1986-2009.

Year	Selected Texas Bay Systems Pounds/Hour (heads-on)					Offshore Catch (Millions of Pounds)
	San Antonio	Corpus Christi	Aransas	Matagorda	Galveston	
1986	40	20	40	40	48	27.1
1987	45	20	41	45	50	27.2
1988	75	38	46	33	45	22.5
1989	29	25	26	18	31	30.3
1990	64	54	62	55	63	33.3
1991	41	38	56	31	23	32.9
1992	14	25	19	12	23	24.7
1993	44	32	28	32	28	21.1
1994	53	50	54	51	32	25.5
1995	38	45	38	ND	22	23.5
1996	40	32	43	30	18	22.3
1997	35	48	52	25	31	17.0
1998	56	48	37	37	26	27.0
1999	47	32	35	34	33	22.0
2000	45	32	29	32	42	31.1
2001	60	45	35	60	34	24.6
2002	44	35	38	19	16	23.3
2003	43	35	53	32	26	25.3
2004	NE	31	9	45	19	21.5
2005	53	36	30	33	9	20.3
2006	41	ND	ND	19	27	25.2
2007	47	ND	ND	47	14	19.1
2008	21	ID	21	NE	18	18.3*
Historical Average	**44**	**36**	**38**	**35**	**29**	
2009	74	≤50	62	61	16	
Dominant Count	51-60; 61-70	61-70	81-100	61-70	81-100	

*Preliminary NE - No effort. ID - Insufficient data. ND - No data.

Table 5. Texas offshore brown shrimp catch predictions (millions of pounds) based on Galveston Bay bait index values. Average catch (July-June) from 1960-2007 was 26.0 million pounds.

Year	Predicted Catch	Actual Catch	Difference
1960	29.1	34.0	4.9
1961	20.0	13.2	-6.8
1962	21.5	17.3	-4.2
1963	29.0	24.6	-4.4
1964	22.6	18.6	-4.0
1965	25.6	26.4	0.8
1966	-	31.1	-
1967	39.0	42.7	3.7
1968	22.0	27.9	5.9
1969	26.3	24.7	-1.6
1970	33.7	30.7	-3.0
1971	37.1	34.4	-2.7
1972	38.0	35.4	-2.6
1973	19.4	23.2	3.8
1974	23.8	25.8	2.0
1975	-	23.7	-
1976	23.8	25.7	1.9
1977	30.5	34.4	3.9
1978	25.5	27.7	2.2
1979	-	16.5	-
1980	26.7	26.6	-0.1
1981	29.3	41.3	12.0
1982	21.5	21.6	0.1
1983	17.8	18.1	0.3
1984	22.9	24.1	1.2
1985	29.0	30.3	1.3
1986	25.3	27.1	1.8
1987	25.7	27.2	1.5
1988	25.9	22.5	-3.4
1989	23.1	30.3	7.2
1990	-	33.3	-
1991	23.1	32.9	9.8
1992	24.1	24.7	0.6
1993	26.8	21.1	-5.7
1994	27.1	25.5	-1.6
1995	29.1	23.5	-5.6
1996	25.1	22.3	-2.8
1997	28.2	17.0	-11.2
1998	25.8	27.0	1.2
1999	24.5	22.0	-2.5
2000	30.0	31.1	1.1
2001	23.7	24.6	0.9
2002	26.6	23.3	-3.3
2003	21.6	25.3	3.7
2004	22.5	21.5	-1.0
2005	23.3	20.3	-3.0
2006	23.8	25.2	1.4
2007	25.9	19.1	-6.8
2008	21.8	18.3*	-2.5
2009	24.7		

*Preliminary

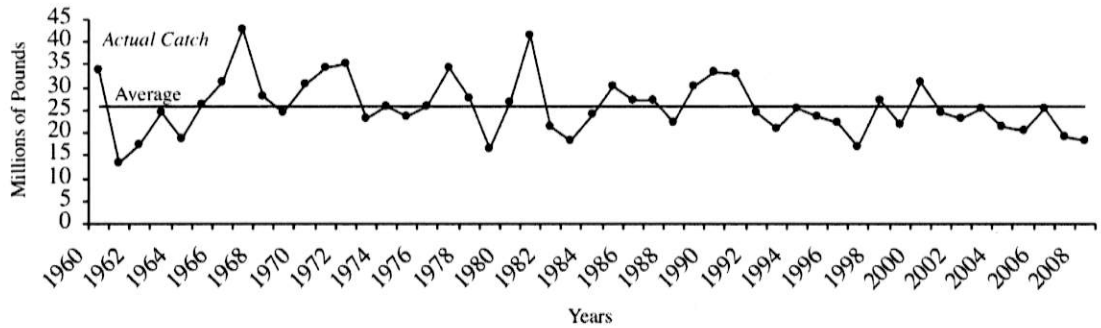

Table 6. Louisiana inshore and offshore brown shrimp prediction (millions of pounds) based on May catch index values. Average catch (May - April) from 1960-2007 was 30.9 million pounds. Acreage with salinities greater than 10 ppt is in millions of acres. Mississippi River discharge is thousand cubic feet per second (TCFS). *Source: Louisiana Department of Wildlife and Fisheries.

Year	Predicted Catch	Actual Catch	Difference	*Acreage > 10 ppt	*Discharge (TCFS)
1960		15.6			
1961		9.2			
1962		7.3			
1963		16.9			
1964		9.6			
1965		17.7			
1966		18.7			
1967		29.5		2.3	
1968		25.4		1.9	
1969		25.2		1.6	
1970		28.1		2.1	
1971		30.7		1.9	
1972		32.2		1.8	
1973		17.9		1.0	
1974		20.6		1.2	
1975		18.1		1.3	
1976		37.5		1.6	510
1977		49.1		1.8	665
1978		45.9		1.5	856
1979		36.7		1.2	1288
1980		23.8		0.5	1002
1981		44.3		2.8	313
1982		33.0		1.5	779
1983		24.9		0.9	955
1984		33.3		1.6	1048
1985	40.3	33.7	-6.6	1.8	924
1986	50.0	44.1	-5.9	2.5	546
1987	32.9	40.0	7.1	1.5	694
1988	30.2	34.3	4.1	1.4	681
1989	43.7	37.6	-6.1	1.8	893
1990	60.0	45.9	-14.1	1.2	809
1991	35.4	32.0	-3.4	1.0	936
1992	26.3	28.2	1.9	1.6	555
1993	-	27.7	-	0.8	1098
1994	31.7	24.6	-7.1	1.2	958
1995	36.5	31.7	-4.8	1.6	505
1996	31.8	35.3	3.5	1.9	592
1997	25.5	29.3	3.8	1.0	1155
1998	40.3	34.2	-6.1	1.4	926
1999	45.0	42.7	-2.3	1.8	683
2000	47.1	43.9	-3.2	2.5	590
2001	62.4	42.1	-20.3	1.7	692
2002	39.0	36.2	-2.8	1.5	985
2003	42.0	44.7	2.7	1.4	507
2004	41.2	37.5	-3.7	0.7	552
2005	21.0	31.0	10.0	0.9	664
2006	37.8	40.3	2.5	2.3	427
2007	32.9	36.1	3.2	1.9	636
2008	29.2	20.9*	-8.3	1.5	1363
2009	29.2			NA	767

*Preliminary